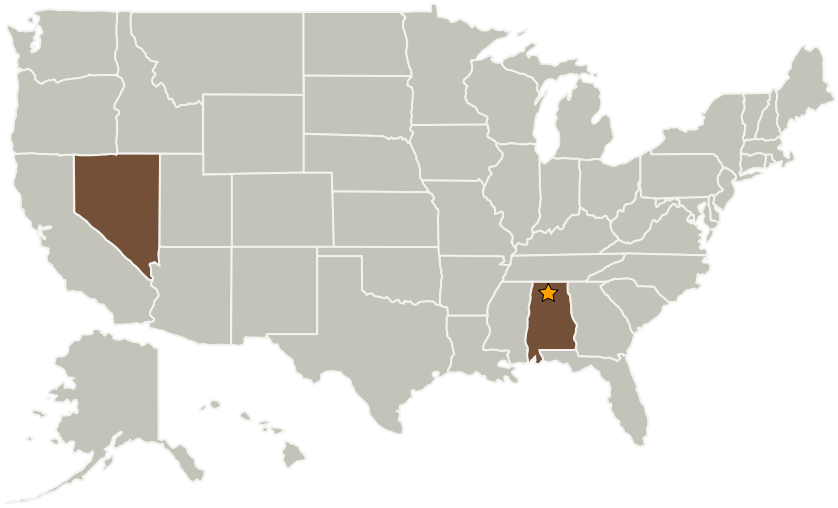
Rocket Combustor Validation Data for Advanced Combustion Models, Phase I

Completed Technology Project (2005 - 2006)

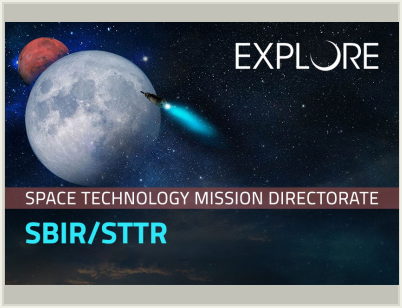
Project Introduction

The pace and cost of developing an engine system for future explorations is strongly influenced by the inadequacies of design tools and the supporting databases. The inability to predict the internal operating environments of a combustion chamber during the design process necessitates design iterations during the development process. NASA and the Department of Defense are working to increase the fidelity and accuracy of the tools used during the design process to define these internal operating environments. Key to the development of advanced analysis tools is appropriate validation data of adequate fidelity. The goal of this STTR is to develop a comprehensive hot-fire liquid-rocket engine test database that is appropriate for the validation of advanced two and three-dimensional computational fluid dynamics (CFD) models and the anchoring of lower-fidelity analytical design tools. The initial focus will be to generate high-quality data on wall heat flux, axial energy release and exit-plane species concentration distribution.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Sierra Engineering, Inc.	Supporting Organization	Industry	Carson City, Nevada



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
Alabama	Nevada

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.5 Modeling and Simulation for EDL